

Radiation Hardened Ethernet PHY and Switch Fabric, Phase I

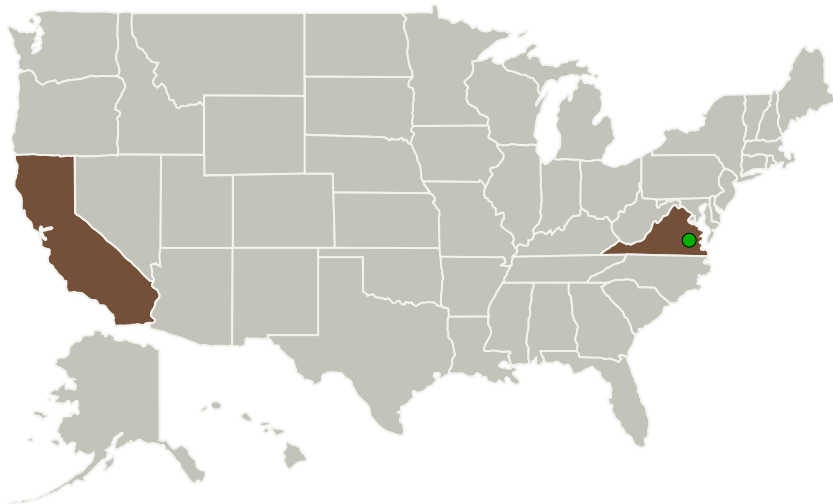
Completed Technology Project (2011 - 2011)



Project Introduction

Innoflight will develop a new family of radiation hardened (up to 3 Mrad(Si)), fault-tolerant, high data-rate (up to 8 Gbps), low power Gigabit Ethernet PHY and Switch chips to meet a critical need in the space industry. Modern spacecraft payloads demand high throughput while maintaining extremely high levels of reliability and fault tolerance. Currently, no standardized protocols presently offer space-level products that provide gigabit-class throughputs. One-off protocols have many drawbacks including long development times, high potential for error, a lack of existing materials, and do not lend themselves to easy prototyping since COTS products are unavailable. These chips will retain the power of using the Ethernet standard but will be extended in an innovative way that will allow data rates up to 8 Gbps per port but will still be compatible with ground hardware for development purposes. Through automated fault monitoring the PHY chip will be automatically detect link failures and the only adverse effect will be a reduction in throughput.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Innoflight, Inc.	Lead Organization	Industry Veteran-Owned Small Business (VOSB)	San Diego, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

California	Virginia
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Project Transitions

**February 2011:** Project Start**September 2011:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138437>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Innoflight, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joseph Koeniger

Co-Investigator:

Joe Koeniger

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Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - └ TX02.1 Avionics Component Technologies
 - └ TX02.1.3 High Performance Processors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System